

ETSI TS 128 709 V18.0.0 (2024-05)



**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Evolved Packet Core (EPC) Network Resource Model (NRM)
Integration Reference Point (IRP);
Solution Set (SS) definitions
(3GPP TS 28.709 version 18.0.0 Release 18)**



Reference

RTS/TSGS-0528709vi00

Keywords

LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2024.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <https://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	5
Introduction	5
1 Scope	6
2 References	6
3 Definitions and abbreviations.....	7
3.1 Definitions	7
3.2 Abbreviations	7
4 Solution Set definitions	8
Annex A (normative): CORBA Solution Set	9
A.0 General	9
A.1 Architectural features	9
A.1.0 Introduction	9
A.1.1 Syntax for Distinguished Names	9
A.2 Mapping	9
A.2.1 General mapping	9
A.2.2 Information Object Class (IOC) mapping	9
A.2.2.1 IOC MMEFunction.....	9
A.2.2.2 IOC MMEPool.....	9
A.2.2.3 IOC MMEPoolArea.....	10
A.2.2.4 IOC EP_RP_EPS	10
A.2.2.5 IOC ExternalMMEFunction	10
A.2.2.6 IOC ServingGWFunction	10
A.2.2.7 IOC ExternalServingGWFunction.....	10
A.2.2.8 IOC QCISet	10
A.2.2.9 IOC MBMSGWFunction.....	10
A.2.2.10 IOC ServingGwCFunction	11
A.2.2.11 IOC ExternalServingGwCFunction.....	11
A.3 Solution Set definitions	12
A.3.1 IDL definition structure.....	12
A.3.2 IDL specification "EPCResourcesNRMDefs.idl"	12
Annex B (normative): XML definitions	18
B.0 General	18
B.1 Architectural features	18
B.1.0 Introduction	18
B.1.1 Syntax for Distinguished Names	18
B.2 Mapping	18
B.2.1 General mapping	18
B.2.2 Information Object Class (IOC) mapping	18
B.3 Solution Set definitions	18
B.3.1 XML definition structure.....	18
B.3.2 XML schema "epcNrm.xsd"	19
Annex C (informative): Change history	33

History34

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

28.707: Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements

28.708: Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)

28.709: Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

1 Scope

The present document specifies the Solution Sets for the EPC NRM IRP.

The Solution Set definition is related to 3GPP TS 28.708 V15.0.X [3].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 28.708: "Telecommunication management; Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".
- [3] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Solution Set (SS) definitions".
- [4] 3GPP TS 32.606: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); Solution Set (SS) definitions".
- [5] W3C REC-xml-names-20060816: "Namespaces in XML 1.1 (Second Edition)".
- [6] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [7] W3C REC-xml11-20060816: "Extensible Markup Language (XML) 1.1 (Second Edition)".
- [8] Void
- [9] W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures.
- [10] W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.
- [11] 3GPP TS 28.623: "Generic Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definition".
- [12] 3GPP TS 28.541: "Management and orchestration of 5G networks; Network Resource Model (NRM); Stage 2 and stage 3".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

XML file: See definition of [11].

XML document: See definition of [11].

XML declaration: See definition of [11].

XML element: See definition of [11].

empty XML element: See definition of [11].

XML content (of an XML element): See definition of [11].

XML start-tag: See definition of [11].

XML end-tag: See definition of [11].

XML empty-element tag: See definition of [11].

XML attribute specification: See definition of [11].

DTD: See definition of [11].

XML schema: See definition of [11].

XML namespace: See definition of [11].

XML complex type: See definition of [11].

XML element type: See definition of [11].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CM	Configuration Management
CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
DTD	Document Type Definition
eNodeB	evolved NodeB
EPC	Evolved Packet Core
EPDG	Evolved Packet Data Gateway
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
GPRS	General Packet Radio System
IS	Information Service
IDL	Interface Definition Language (OMG)
IOC	Information Object Class
IRP	Integration Reference Point
IS	Information Service
MME	Mobility Management Entity
MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
OMG	Object Management Group

PCRF	Policy and Charging Rules Function
P-GW	PDN Gateway
S-GW	Serving Gateway
SS	Solution Set
XML	eXtensible Markup Language

4 Solution Set definitions

This specifications defines the following 3GPP EPC NRM IRP Solution Set definitions:

- 3GPP EPC NRM IRP CORBA SS (Annex A)
- 3GPP EPC NRM IRP XML definitions (Annex B)

Annex A (normative): CORBA Solution Set

A.0 General

This annex contains the CORBA Solution Set for the IRP whose semantics is specified in EPC Network Resource Model (NRM) IRP: Information Service (TS 28.708 [2]).

A.1 Architectural features

A.1.0 Introduction

The overall architectural feature of EPC NRM IRP is specified in 3GPP TS 28.708 [2].

This clause specifies features that are specific to the CORBA SS.

A.1.1 Syntax for Distinguished Names

See clause A.1.1 of [11]. A.1.2 Rules for NRM extensions

See clause A.1.2 of [11].

A.2 Mapping

A.2.1 General mapping

See clause A.1.2.1 of [11].

A.2.2 Information Object Class (IOC) mapping

A.2.2.1 IOC MMEFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
mMEC	mMEC	long
mMEPool	mMEPool	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference

A.2.2.2 IOC MMEPool

IS Attributes	SS Attributes	SS Type
id	id	string
mMEGI	mMEGI	long
mMEPoolMemberList	mMEPoolMemberList	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReferenceSet
mMEPoolArea	mMEPoolArea	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference

A.2.2.3 IOC MMEPoolArea

IS Attributes	SS Attributes	SS Type
id	id	string
mMEPool	mMEPool	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference
tACLlist	tACLlist	GenericNetworkResourcesIRPSystem::AttributeTypes::LongSet
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType

A.2.2.4 IOC EP_RP_EPS

IS Attributes	SS Attributes	SS Type
farEndNeIpAddr	farEndNeIpAddr	string

A.2.2.5 IOC ExternalMMEFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
mMEC	mMEC	long
mMEPool	mMEPool	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference

A.2.2.6 IOC ServingGWFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
tACLlist	tACLlist	GenericNetworkResourcesIRPSystem::AttributeTypes::LongSet

A.2.2.7 IOC ExternalServingGWFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
tACLlist	tACLlist	GenericNetworkResourcesIRPSystem::AttributeTypes::LongSet

A.2.2.8 IOC QCISet

IS Attributes	SS Attributes	SS Type
id	id	string
qCIList	qCIList	genericEPCNRMAAttributeTypes::AttributeTypes::qciListType

A.2.2.9 IOC MBMSGWFunction

IS Attributes	SS Attributes	SS Type
id	id	string

A.2.2.10 IOC ServingGwCFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
tACLlist	tACLlist	GenericNetworkResourcesIRPSystem::AttributeTypes::LongSet

A.2.2.11 IOC ExternalServingGwCFunction

IS Attributes	SS Attributes	SS Type
id	id	string
pLMNidList	pLMNidList	genericEPCNRMAAttributeTypes::AttributeTypes::plmnIdListType
tACLlist	tACLlist	GenericNetworkResourcesIRPSystem::AttributeTypes::LongSet

A.3 Solution Set definitions

A.3.1 IDL definition structure

Clause A.3.2 defines the types and constants which are used by the EPC NRM IRP.

A.3.2 IDL specification "EPCResourcesNRMDefs.idl"

```
//File:EPCResourcesNRMDefs.idl
#ifndef _EPCNETWORKRESOURCESNRMDEFS_IDL_
#define _EPCNETWORKRESOURCESNRMDEFS_IDL_
#include "GenericNetworkResourcesNRMDefs.idl"
#pragma prefix "3gppsa5.org"
/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module EPCNetworkResourcesNRMDefs
{
    /**
     * Definitions for MO class EPDGFunction
     */
    interface EPDGFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "EPDGFunction";
        // No New Attribute Names
        //
    };

    /**
     * Definitions for MO class MMEFunction
     */
    interface MMEFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "MMEFunction";
        // Attribute Names
        //
        const string id = "id";
        const string pLMNIdList = "pLMNIdList";
        const string mMEC = "mMEC";
        const string mMEPool = "mMEPool";
    };

    /**
     * Definitions for MO class PCRFFunction
     */
    interface PCRFFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "PCRFFunction";
        // No New Attribute Names
        //
    };

    /**
     * Definitions for MO class PGWFunction
     */
    interface PGWFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "PGWFunction";
        // No New Attribute Names
        //
        //
    };

    /**
     * Definitions for MO class PGWCFunction
     */
    interface PGWCFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "PGWCFunction";
        // No New Attribute Names
    };
};
```

```
    //
    //
};

/**
 * Definitions for MO class PGWUFunction
 */
interface PGWUFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "PGWUFunction";
    // No New Attribute Names
    //
    //
};

/**
 * Definitions for MO class ServingGWFunction
 */
interface ServingGWFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ServingGWFunction";
    // Attribute Names
    const string id = "id";
    const string pLMNidList = "pLMNidList";
    const string tACLList = "tACLList";
    //
};

/**
 * Definitions for MO class ServingGWCFFunction
 */
interface ServingGWCFFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ServingGWCFFunction";
    // Attribute Names
    const string id = "id";
    const string pLMNidList = "pLMNidList";
    const string tACLList = "tACLList";
    //
};

/**
 * Definitions for MO class ServingGWUFunction
 */
interface ServingGWUFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ServingGWUFunction";
    // No New Attribute Names
    //
    //
};

/**
 * Definitions for MO class MMEPool
 */
interface MMEPool : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "MMEPool";
    // Attribute Names
    //
    const string id = "id";
    const string mMEGI = "mMEGI";
    const string mMEPoolMemberList = "mMEPoolMemberList";
    const string mMEPoolArea = "mMEPoolArea";
};

/**
 * Definitions for MO class MMEPoolArea
 */
interface MMEPoolArea : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "MMEPoolArea";
    // Attribute Names
    //
    const string id = "id";
    const string mMEPool = "mMEPool";
    const string tACLList = "tACLList";
    const string sGWAddress = "sGWAddress";
};
```

```
    const string pLMNidList = "pLMNidList";
};

/**
 * Definitions for MO class EP_RP_EPS
 */
interface EP_RP_EPS : GenericNetworkResourcesNRMDefs::EP_RP
{
    const string CLASS = "EP_RP_EPS";
    // Attribute Names
    const string farEndNeIpAddr = "farEndNeIpAddr";
};

/**
 * Definitions for MO class Link_ENB_MME
 */
interface Link_ENB_MME : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_ENB_MME";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_ENB_ServingGW
 */
interface Link_ENB_ServingGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_ENB_ServingGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_EPDG_PCRF
 */
interface Link_EPDG_PCRF : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_EPDG_PCRF";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_EPDG_PGW
 */
interface Link_EPDG_PGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_EPDG_PGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_HSS_MME
 */
interface Link_HSS_MME : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_HSS_MME";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_MME_MME
 */
interface Link_MME_MME : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_MME_MME";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_MME_SGSN
 */
interface Link_MME_SGSN : GenericNetworkResourcesNRMDefs::Link
{
```

```
    const string CLASS = "Link_MME_SGSN";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_MME_ServingGW
 */
interface Link_MME_ServingGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_MME_ServingGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_PCRF_ServingGW
 */
interface Link_PCRF_ServingGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_PCRF_ServingGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_PCRF_PGW
 */
interface Link_PCRF_PGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_PCRF_PGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_PGW_ServingGW
 */
interface Link_PGW_ServingGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_PGW_ServingGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class Link_SGSN_ServingGW
 */
interface Link_SGSN_ServingGW : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_SGSN_ServingGW";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class ExternalMMEFunction
 */
interface ExternalMMEFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalMMEFunction";
    // Attribute Names
    //
    const string id = "id";
    const string pLMNIdList = "pLMNIdList";
    const string mMEC = "mMEC";
    const string mMEPool = "mMEPool";
};

/**
 * Definitions for MO class ExternalServingGWFunction
 */
interface ExternalServingGWFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalServingGWFunction";
    // Attribute Names
    //
};
```



```
    const string id = "id";
    const string pLMNidList = "pLMNidList";
    const string tACLList = "tACLList";
};

/**
 * Definitions for MO class ExternalServingGWCFUNCTION
 */
interface ExternalServingGWCFUNCTION : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalServingGWCFUNCTION";
    // Attribute Names
    //
    const string id = "id";
    const string pLMNidList = "pLMNidList";
    const string tACLList = "tACLList";
};

/**
 * Definitions for MO class ExternalServingGWUFUNCTION
 */
interface ExternalServingGWUFUNCTION : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalServingGWUFUNCTION";
    // No New Attribute Names
    //
    //
};

/**
 * Definitions for MO class ExternalPGWCFUNCTION
 */
interface ExternalPGWCFUNCTION : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalPGWCFUNCTION";
    // No New Attribute Names
    //
    //
};

/**
 * Definitions for MO class ExternalPGWUFUNCTION
 */
interface ExternalPGWUFUNCTION : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalPGWUFUNCTION";
    // No New Attribute Names
    //
    //
};

/**
 * Definitions for MO class QCISet
 */
interface QCISet : GenericNetworkResourcesNRMDefs::ManagedFunction
{
    const string CLASS = "QCISet";
    // Attribute Names
    //
    const string id = "id";
    const string qCILList = "qCILList";
};

/**
 * Definitions for MO class Link_MBMSGW_ENB
 */
interface Link_MBMSGW_ENB : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_MBMSGW_ENB";
    // No New Attribute Names
    //
};

/**
 * Definitions for MO class MBMSGWFUNCTION
 */
interface MBMSGWFUNCTION : GenericNetworkResourcesNRMDefs::ManagedFunction
```

```
{
    const string CLASS = "MBMSGWFunction";
    // Attribute Names
    //
    const string id = "id";
};
}

module genericEPCNRMAAttributeTypes
{
    /**
     * Definitions for struct PlmnIdType
     */
    struct PlmnIdType
    {
        short mcc;
        short mnc;
    };

    typedef sequence<PlmnIdType> plmnIdListType;

    /**
     * Definitions for struct QciType
     */
    struct QciType
    {
        short qci;
        boolean resourceType;
        // True is GBR, False is Non-GBR
        short priority;
        short packetDelayBudget;
        float packetErrorLossRate;
    };

    typedef sequence<QciType> qciListType;
};
#endif // _EPCNETWORKRESOURCESNRMDEFS_IDL_
```

Annex B (normative): XML definitions

B.0 General

This annex contains the XML definitions for the EPC NRM IRP as it applies to Itf-N, in accordance with EPC NRM IRP IS definitions [2].

The XML file formats are based on XML [7], XML Schema [9] [10] and XML Namespace [5] standards.

B.1 Architectural features

B.1.0 Introduction

The overall architectural feature of EPC Network Resource Model IRP is specified in 3GPP TS 28.708 [2]. This clause specifies features that are specific to the XML definitions SS.

B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [6].

B.2 Mapping

B.2.1 General mapping

An IOC maps to an XML element of the same name as the IOC's name in the IS. An IOC attribute maps to a sub-element of the corresponding IOC's XML element, and the name of this sub-element is the same as the attribute's name in the IS.

B.2.2 Information Object Class (IOC) mapping

The overall description of the file format of configuration data XML files is provided by 3GPP TS 32.616 [3].

B.2.2 defines the NRM-specific XML schema `epcNrm.xsd` for the EPC NRM IRP IS defined in 3GPP TS 28.708 [2].

XML schema `epcNrm.xsd` explicitly declares NRM-specific XML element types for the related NRM.

The definition of those NRM-specific XML element types complies with the generic mapping rules defined in 3GPP TS 32.616 [3].

B.3 Solution Set definitions

B.3.1 XML definition structure

The XML definitions of this document specify the schema for configuration content.

When using the XML definitions for a configuration file transfer with the Bulk CM IRP, using either CORBA Solution Set of 3GPP TS 32.616 [3] or SOAP Solution Set of 3GPP TS 32.616 [3], the basic part of the XML file format definition is provided by 3GPP TS 32.616 [3]. The XML definitions of this document provide the schema for the configuration content to be included in such a configuration file.

When using the XML definitions with a SOAP solution set of any interface IRP that perform operations on managed objects, for example the Basic CM IRP SOAP SS of 3GPP TS 32.606 [4], the XML definitions of this document provides the schema for the configuration content operated on by the interface IRP. Such configuration content can be name of managed object and, if applicable, IOC attributes.

B.3.2 XML schema “epcNrm.xsd”

```
<?xml version="1.1" encoding="UTF-8"?>

<!--
  3GPP TS 28.709 EPC Network Resource Model IRP
  XML schema definition
  epcNrm.xsd
-->

<schema
  targetNamespace="http://www.3gpp.org/ftp/specs/archive/28_series/28.709#epcNrm"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:xn="http://www.3gpp.org/ftp/specs/archive/28_series/28.623#genericNrm"
  xmlns:epc="http://www.3gpp.org/ftp/specs/archive/28_series/28.709#epcNrm"
  xmlns:ngc="http://www.3gpp.org/ftp/specs/archive/28_series/28.541#ngcNrm"
>

  <import namespace="http://www.3gpp.org/ftp/specs/archive/28_series/28.623#genericNrm"/>

  <!--EPC NRM IRP IS class associated XML elements -->
  <complexType name="PLMNId">
    <sequence>
      <element name="mcc" type="short" minOccurs="0"/>
      <element name="mnc" type="short" minOccurs="0"/>
    </sequence>
  </complexType>
  <complexType name="PLMNIdList">
    <sequence>
      <element name="pLMNId" type="epc:PLMNId" minOccurs="0" />
    </sequence>
  </complexType>
  <complexType name="TACList">
    <sequence>
      <element name="tAC" type="long" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
  <complexType name="QCIType">
    <sequence>
      <element name="qci" type="short" minOccurs="0"/>
      <element name="resourceType" type="boolean" minOccurs="0"/>
      <!-- True is GBR, and False is Non-GBR -->
      <element name="priority" type="short" minOccurs="0"/>
      <element name="packetDelayBudget" type="short" minOccurs="0"/>
      <element name="packetErrorLossRate" type="decimal" minOccurs="0"/>
    </sequence>
  </complexType>
  <complexType name="QCIListType">
    <sequence>
      <element name="qCIInfo" type="epc:QCIType" minOccurs="0" />
    </sequence>
  </complexType>

  <element
    name="EPDGFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
```

```

    <element name="attributes" minOccurs="0">
      <complexType>
        <all>
          <element name="userLabel" type="string" minOccurs="0"/>
          <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
          <element name="linkList" type="xn:linkListType" minOccurs="0"/>
        </all>
      </complexType>
    </element>
    <choice minOccurs="0" maxOccurs="unbounded">
      <element ref="epc:EPDGFunctionOptionallyContainedNrmClass"/>
      <element ref="epc:EP_RP_EPS"/>
      <element ref="xn:VsDataContainer"/>
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element
  name="MMEFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                <element name="mMEC" type="long" minOccurs="0"/>
                <element name="mMEPool" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:MMEFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="ngc:EP_N26"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="PCRFFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="linkList" type="xn:linkListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:PCRFFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

<element
  name="PGWFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:PGWFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="PGWCFFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:PGWCFFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="PGWUFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:PGWUFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

    </complexContent>
  </complexType>
</element>

<element
  name="ExternalPGWCFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ExternalPGWUFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ServingGWFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                <element name="tACLList" type="epc:TACLList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:ServingGWFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ServingGwCFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                <element name="tACList" type="epc:TACList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:ServingGwCFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ServingGwUFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:ServingGwUFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ExternalServingGWFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                <element name="tACList" type="epc:TACList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```



```

        </all>
      </complexType>
    </element>
    <choice minOccurs="0" maxOccurs="unbounded">
      <element ref="xn:VsDataContainer" />
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element
  name="ExternalServingGwCFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                <element name="tACLList" type="epc:TACLList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer" />
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ExternalServingGwUFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer" />
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element
  name="ExternalMMEFunction"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer" />
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

        <element name="mMEC" type="long" minOccurs="0"/>
        <element name="mMEPool" type="xn:dn" minOccurs="0"/>
    </all>
</complexType>
</element>
<choice minOccurs="0" maxOccurs="unbounded">
    <element ref="xn:VsDataContainer"/>
</choice>
</sequence>
</extension>
</complexContent>
</complexType>
</element>

<element
    name="MMEPool"
    substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
    <complexType>
        <complexContent>
            <extension base="xn:NrmClass">
                <sequence>
                    <element name="attributes" minOccurs="0">
                        <complexType>
                            <all>
                                <element name="userLabel" type="string" minOccurs="0"/>
                                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                                <element name="mMEGI" type="long" minOccurs="0"/>
                                <element name="mMEPoolMemberList" type="xn:dnList" minOccurs="0"/>
                                <element name="mMEPoolArea" type="xn:dn" minOccurs="0"/>
                            </all>
                        </complexType>
                    </element>
                    <choice minOccurs="0" maxOccurs="unbounded">
                        <element ref="epc:MMEPoolOptionallyContainedNrmClass"/>
                        <element ref="xn:VsDataContainer"/>
                    </choice>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

<element
    name="MMEPoolArea"
    substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
    <complexType>
        <complexContent>
            <extension base="xn:NrmClass">
                <sequence>
                    <element name="attributes" minOccurs="0">
                        <complexType>
                            <all>
                                <element name="userLabel" type="string" minOccurs="0"/>
                                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                                <element name="mMEPool" type="xn:dn" minOccurs="0"/>
                                <element name="tACLList" type="epc:TACLList" minOccurs="0"/>
                                <element name="pLMNIdList" type="epc:PLMNIdList" minOccurs="0"/>
                            </all>
                        </complexType>
                    </element>
                    <choice minOccurs="0" maxOccurs="unbounded">
                        <element ref="epc:MMEPoolAreaOptionallyContainedNrmClass"/>
                        <element ref="xn:VsDataContainer"/>
                    </choice>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

<element name="Link_ENB_MME"
    substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
    <complexType>
        <complexContent>

```

```

<extension base="xn:NrmClass">
  <sequence>
    <element name="attributes" minOccurs="0">
      <complexType>
        <all>
          <element name="aEnd" type="xn:dn" minOccurs="0"/>
          <element name="linkType" type="xn:linkType" minOccurs="0"/>
          <element name="protocolName" type="string" minOccurs="0"/>
          <element name="protocolVersion" type="string" minOccurs="0"/>
          <element name="userLabel" type="string" minOccurs="0"/>
          <element name="zEnd" type="xn:dn" minOccurs="0"/>
        </all>
      </complexType>
    </element>
    <choice minOccurs="0" maxOccurs="unbounded">
      <element ref="epc:Link_ENB_MMEOptionallyContainedNrmClass"/>
      <element ref="xn:VsDataContainer"/>
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element name="Link_ENB_ServingGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_ENB_ServingGWOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_EPDG_PCRF"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_EPDG_PCRFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

    </complexContent>
  </complexType>
</element>

<element name="Link_EPDG_PGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_EPDG_PGWOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_HSS_MME"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_HSS_MMEOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_MME_MME"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_MME_MMEOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

    </all>
  </complexType>
</element>
<choice minOccurs="0" maxOccurs="unbounded">
  <element ref="epc:Link_MME_MMEOptionallyContainedNrmClass"/>
  <element ref="xn:VsDataContainer"/>
</choice>
</sequence>
</extension>
</complexContent>
</complexType>
</element>

<element name="Link_MME_SGSN"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_MME_SGSNOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_MME_ServingGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_MME_ServingGWOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_PCRF_ServingGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>

```

```

    <element name="attributes" minOccurs="0">
      <complexType>
        <all>
          <element name="aEnd" type="xn:dn" minOccurs="0"/>
          <element name="linkType" type="xn:linkType" minOccurs="0"/>
          <element name="protocolName" type="string" minOccurs="0"/>
          <element name="protocolVersion" type="string" minOccurs="0"/>
          <element name="userLabel" type="string" minOccurs="0"/>
          <element name="zEnd" type="xn:dn" minOccurs="0"/>
        </all>
      </complexType>
    </element>
    <choice minOccurs="0" maxOccurs="unbounded">
      <element ref="epc:Link_PCRF_ServingGWO optionallyContainedNrmClass"/>
      <element ref="xn:VsDataContainer"/>
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element name="Link_PCRF_PGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_PCRF_PGWO optionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_PGW_ServingGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_PGW_ServingGWO optionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

</element>

<element name="Link_SGSN_ServingGW"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_SGSN_ServingGWOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="EP_RP_EPS">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <!-- Inherited attributes from EP_RP -->
                <element name="farEndEntity" type="xn:dn" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <!-- End of inherited attributes from EP_RP -->
                <element name="farEndNeIpAddr" type="string" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:EP_RP_EPSOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="QCISet"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <element name="qCIIList" type="epc:QCIIListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:QCISetOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

    </extension>
  </complexContent>
</complexType>
</element>

<element name="MBMSGWFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:MBMSGWFunctionOptionallyContainedNrmClass"/>
            <element ref="epc:EP_RP_EPS"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_MBMSGW_ENB"
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="aEnd" type="xn:dn" minOccurs="0"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string" minOccurs="0"/>
                <element name="zEnd" type="xn:dn" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="epc:Link_MBMSGW_ENBOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="EPDGFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="MMEFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="PCRFFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="PGWFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="PGWCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="PGWUFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="ExternalPGWCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
<element name="ExternalPGWUFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ServingGWFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ServingGwCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ServingGwUFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ExternalServingGwCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="ExternalServingGwUFunctionOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="MMEPoolOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>

```



```
<element name="MMEPoolAreaOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_ENB_MMEOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_ENB_ServingGWOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_EPDG_PCRFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_EPDG_PGWOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_HSS_MMEOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_MME_MMEOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_MME_SGSNOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_MME_ServingGWOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_PCRF_ServingGWOOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
<element name="Link_PCRF_PGWOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_PGW_ServingGWOOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_SGSN_ServingGWOOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
<element name="EP_RP_EPSOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="QCISetOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="MBMSGWFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
<element name="Link_MBMSGW_ENBOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>

</schema>
```

Annex C (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2014-06	SA#64	SP-140332	0001	-	F	Upgrade W3C XML Schema version from 1.0 to 1.1	11.1.0
		SP-140358	0002	-	F	remove the feature support statements	11.1.0
2014-09	SA#65	SP-140560	0003	-	C	Update the link from Solution Set to Information Service due to the end of Release 12	12.0.0
2016-01						Update to Rel-13 (MCC)	13.0.0
2016-06	SA#72	SP-160407	0004	-	F	Update the link from IRP Solution Set to IRP Information Service	13.1.0
2017-03	SA#75	-	-	-	-	Promotion to Release 14 without technical change	14.0.0
2017-06	SA#76	SP-170514	0005	-	F	Update the link from IRP Solution Set to IRP Information Service	14.1.0
2017-06	SA#76	SP-170510	0006	1	B	Update the XML Schema definitions to align with IS to support Configuration Management for mobile networks that include virtualized network functions	14.1.0
2018-06	SA#80	SP--180424	0007	1	B	Add EPC CUPS for CORBA SS	15.0.0
2018-06	SA#80	SP--180424	0008	1	B	Add EPC CUPS for CORBA solution set	15.0.0
2018-09	SA#81	SP-180828	0010	-	B	Update EPC SS definitions to support management of EN-DC and 4G/5G interworking	15.1.0
2018-09	SA#81	SP-180829	0011	1	B	Add EPC CUPS for XML solution set	15.1.0
2018-12	SA#82	SP-181050	0012	1	F	CUPS XML schema alignment	15.2.0
2018-12	SA#82	SP-181050	0013	1	F	CUPS CORBA IDL update	15.2.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	16.0.0
2022-03	-	-	-	-	-	Update to Rel-17 version (MCC)	17.0.0
2024-04	-	-	-	-	-	Update to Rel-18 version (MCC)	18.0.0

History

Document history		
V18.0.0	May 2024	Publication